**IN THE CLAIMS:**

1. An integrated circuit comprising:

a power output stage having an output node;

a controller circuit coupled to the power output stage, the controller circuit to selectively switch the power output stage into a current ramp down mode based on detection of a voltage surge at the output node, the power output stage having an associated current ramp down rate; and

a processor coupled to the output node and a surge notification input of the power output stage, the power output stage to accelerate the current ramp down rate based on a notification signal from the processor.

2. The integrated circuit of claim 1 wherein the power output stage includes:

a transistor stack coupled to the controller circuit and having a switching node;

an output inductor having a first terminal coupled to the switching node of the transistor stack and a second terminal coupled to the output node, the output inductor defining a ramp down current path of the power output stage; and

a transient adjustment circuit coupled to the output node and a surge notification output of the processor, the transient adjustment circuit to reduce an effective inductance of the ramp down current path in response to the notification signal.

3. The integrated circuit of claim 2 wherein the transient adjustment circuit includes:

a surge inductor having a first terminal coupled to the output node; and

a surge transistor coupled to a second terminal of the surge inductor and the surge notification output, the surge transistor to switch the surge inductor into a parallel connection with the output inductor in response to the notification signal.

4. The integrated circuit of claim 3 wherein the surge notification output is coupled to the surge transistor through a buffer.

5. The integrated circuit of claim 2 wherein the second terminal of the output inductor is coupled to the output node through a sensing resistor.

6. The integrated circuit of claim 1 wherein the current ramp down mode is to correspond to a gating off of unused portions of the processor.

7. The integrated circuit of claim 1 wherein the notification signal is a pulse signal.

8. The integrated circuit of claim 7 further including a one shot timer coupled to the power output stage and the processor, the one shot timer to receive a level signal from the processor and convert the level signal into the pulse signal based on a ramp down current measurement.

9. The integrated circuit of claim 1 wherein the power output stage is to be coupled to a system voltage and the output node is to be coupled to a processor voltage, the system voltage to be greater than the processor voltage relative to a ground.

10. The integrated circuit of claim 1 further including an output capacitor having a terminal coupled to the output node.

11. The integrated circuit of claim 1 wherein the controller circuit is to switch the power output stage into a current ramp up mode based on a voltage droop at the output node.

12. The integrated circuit of claim 11 wherein the current ramp up mode is to correspond to a gating on of unused portions of the processor.

13. The integrated circuit of claim 11 wherein the controller circuit includes:

a metal oxide semiconductor field effect transistor (MOSFET) driver coupled to the power output stage;

a comparator having a first input coupled to the output node and a comparator output coupled to the MOSFET driver; and

a reference component to apply a reference voltage to a second input of the comparator.

14. The integrated circuit of claim 13 wherein the reference voltage component is a Zener diode.

15. A computer system comprising:

a power supply; and

an integrated circuit, the integrated circuit including a power output stage, a controller circuit coupled to the power output stage, and a processor coupled to a surge notification input of the power output stage, the power output stage to receive a system voltage of the power supply and having an output node to receive a processor voltage of the power supply, the controller circuit to selectively switch the power output stage into a current ramp down mode based on a voltage surge at the output node, the power output stage having an associated current ramp down rate, the power output stage to accelerate the current ramp down rate based on a notification signal from the processor.

16. The computer system of claim 15 wherein the power output stage includes:

a transistor stack coupled to the controller circuit and having a switching node;

an output inductor having a first terminal coupled to the switching node of the transistor stack and a second terminal coupled to the output node, the output inductor defining a ramp down current path of the power output stage;

a transient adjustment circuit coupled to the output node, a ground of the power supply and a surge notification output of the processor, the transient adjustment circuit to reduce an effective inductance of the ramp down current path in response to the notification signal.

17. The computer system of claim 16 wherein the transient adjustment circuit includes:

a surge inductor having a first terminal coupled to the output node; and

a surge transistor coupled to a second terminal of the surge inductor and the surge notification output, the surge transistor to switch the surge indicator into a parallel connection with the output inductor in response to the notification signal.

18. The computer system of claim 17 wherein the surge notification output is coupled to the surge transistor through a buffer.

19. The computer system of claim 16 wherein the second terminal of the output inductor is coupled to the output node through a sensing resistor.

20. The computer system of claim 15 wherein the current ramp down mode is to correspond to a gating off of unused portions of the processor.

21. The computer system of claim 15 wherein the notification signal is a pulse signal.

22. A method of protecting a processor from voltage surges, comprising:

switching a power output stage into a current ramp down mode based on a voltage surge at an output node of the power output stage, the power output stage having an associated current ramp down rate;

accelerating the current ramp down rate based on a surge notification signal from the processor.

23. The method of claim 22 further including reducing an effective inductance of a ramp down current path of the power output stage.

24. The method of claim 23 further including switching a surge inductor into a parallel connection with an output inductor of the power output stage.

25. The method of claim 22 further including generating a pulse signal based on the notification signal.

26. The method of claim 25 further including:

receiving a level signal; and

converting the level signal into the pulse signal based on a ramp down current measurement.

27. An integrated circuit comprising:

a power output stage, the power output stage including a transistor stack, an output inductor and a transient adjustment circuit, the transistor stack having a switching node, the output inductor defining a ramp down current path and having a first terminal coupled to the switching node and a second terminal coupled to an output node of the power output stage;

a controller circuit coupled to the power output stage, the controller circuit including a metal oxide semiconductor field effect transistor (MOSFET) driver, a comparator and a reference component, the MOSFET driver coupled to the transistor stack of the power output stage, the comparator having a first input coupled to the output node and a comparator output coupled to the MOSFET driver, the reference component to apply a reference voltage to a second input of the comparator;

a processor coupled to the output node and having a surge notification output coupled to a surge notification input of the transient adjustment circuit, the transient adjustment circuit to reduce an effective inductance of the ramp down current path in response to a surge notification signal from the processor, the notification signal to correspond to a gating off of unused portions of the processor.

28. The integrated circuit of claim 27 wherein the transient adjustment circuit includes:

a surge inductor having a first terminal coupled to the output node; and

a surge transistor coupled to a second terminal of the surge inductor and the surge notification output, the surge transistor to switch the surge inductor into a parallel connection with the output inductor in response to the notification signal.

29. The integrated circuit of claim 28 wherein the surge notification output is coupled to the surge transistor through a buffer.

30. The integrated circuit of claim 27 further including an output capacitor having a terminal coupled to the output node.